

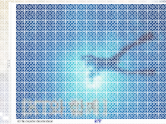
Innovative Thinking: The Rise and Fall

- Network Operations and Management 2.0 (NOM2.0) -

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Agenda

- 1 Trends in Telecom Market and QPS Strategy of KT
- 2 Challenges for Next Generation Network Operations and Management
- 3 Innovative Network Operations and Management Towards NOM2.0
- 4 Summary and Remarks

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Trends in Telecom Market and QPS Strategy of KT

Trends of Telecom Business Environments – Increase of QPS requirements

- **Customer Needs: Complex & diverse**
- **Market Situation : High saturation & fierce competition**
- **Deregulation : From the vertical to horizontal**
- **High-tech operator centric → High-touch customer centric**

- **Customer Value in Quadruple Play Service (QPS)**
 - ▶ Freedom of choosing desired services → **Service convergence**
 - ▶ Maximizing usability of unified device → **Device convergence**
 - ▶ Offering new joy rapidly & seamlessly → **Network convergence**



KT-QPS+ : Blended service for new customer value

KT-QPS: Bundling Service

- Lineup of various bundle services
- Core service bundle in accordance with market & regulation status

KT-QPS+: Blended Service

- Service Integration for adding customer values
- FMC providing all blended services with any device at any time through any network
- Expanding blended service to neighboring areas



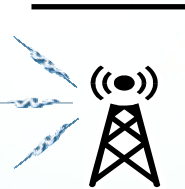
Device Convergence –

Rich communication & more infotainment by unified device

- **Diverse connections by various communication tools**
 - ▶ Supporting the best connection method automatically with SSO
 - ▶ Unifying info-devices using Wi-Fi and residential gateways
- **Service & device integration for better convenience & faster access**
 - ▶ Developing first window services for SNS & searching optimized web 2.0

Versatile Networking

Ethernet
Wi-Fi
WiBro(M-WiMAX)
W-CDMA
DMB



Function Convergence



(source : Fortune, OCT. 2006)

Service & Device Integration



Network Convergence –

NGN and Layered Service Delivery Architecture

- **NGN status & plan**

- ▶ Replacing local and toll switches with SSW, AGW, SGW and TGW
- ▶ Building a new IP backbone (Premium Backbone)

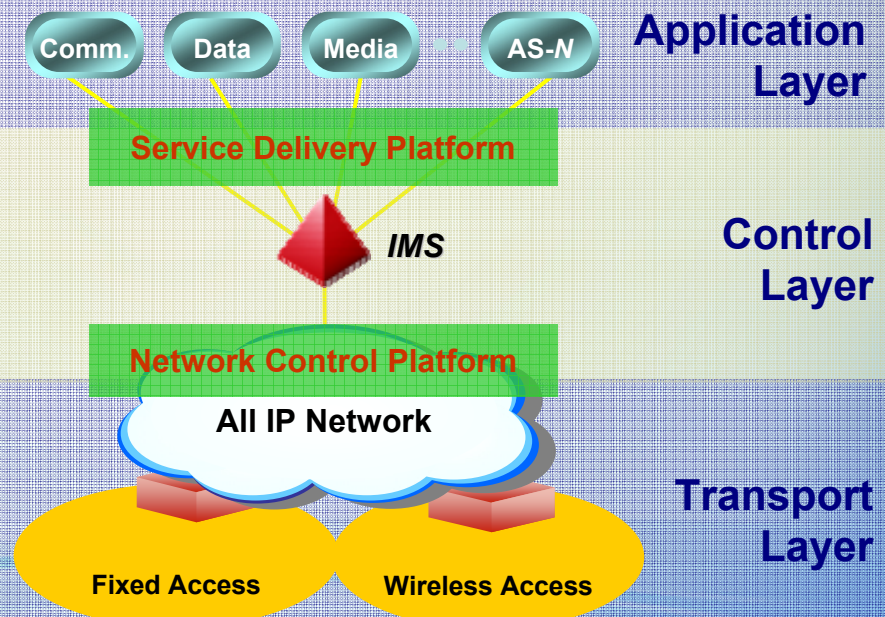
- **Deploying IMS as service control platforms**

- **Defining Service Delivery Platform (SDP)**

One source, multi-use
Timely deployment of KT-QPS+ services

Supporting personalization & intelligence
to realize KT-QPS+

Guaranteeing network quality
with QoS and security



Fixed Access (FTTH) – Overcoming the limit of copper line

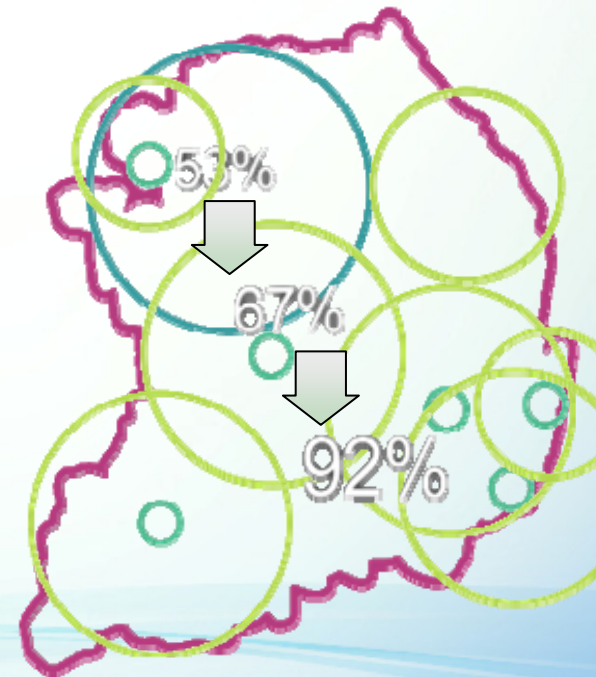
● Objectives of the First One-Mile Project (FTTH deployment)

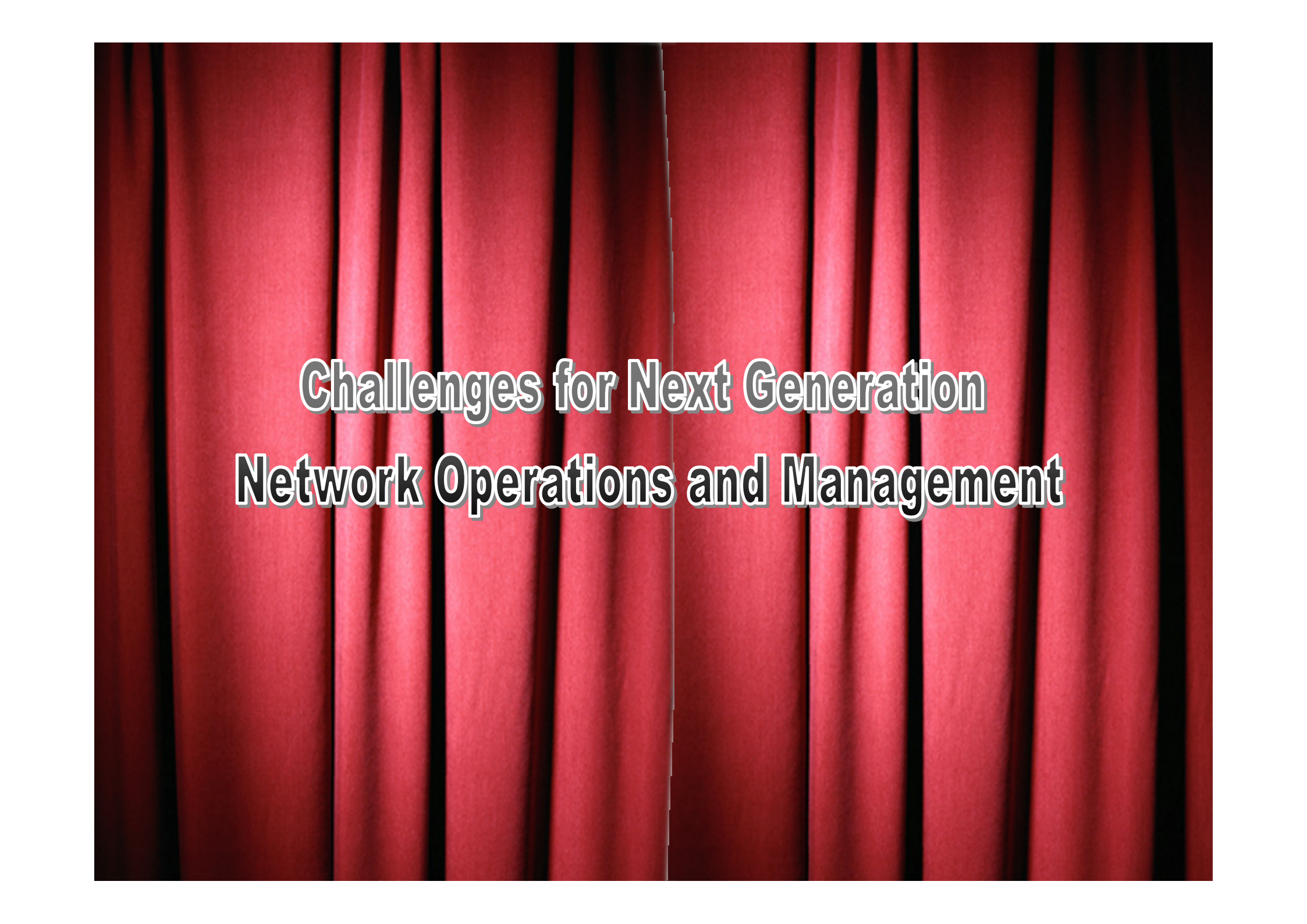
- ▶ To provide customers with new values through the best quality
- ▶ To provision enough bandwidth for QPS
- ▶ To integrate nodes and improve reliability

“First One-Mile” Project

- 2007** Drive FTTH Rollout
(53% Coverage, \$440 mil.)
- 2008** Expanding Coverage for QPS+
(67% Coverage, \$790 mil.)
- 2010** Establishing Nation-wide
(92% Coverage, \$1.3 bn)

* Cumulative CAPEX



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Challenges for Next Generation Network Operations and Management

Objectives – Network Operations and Management

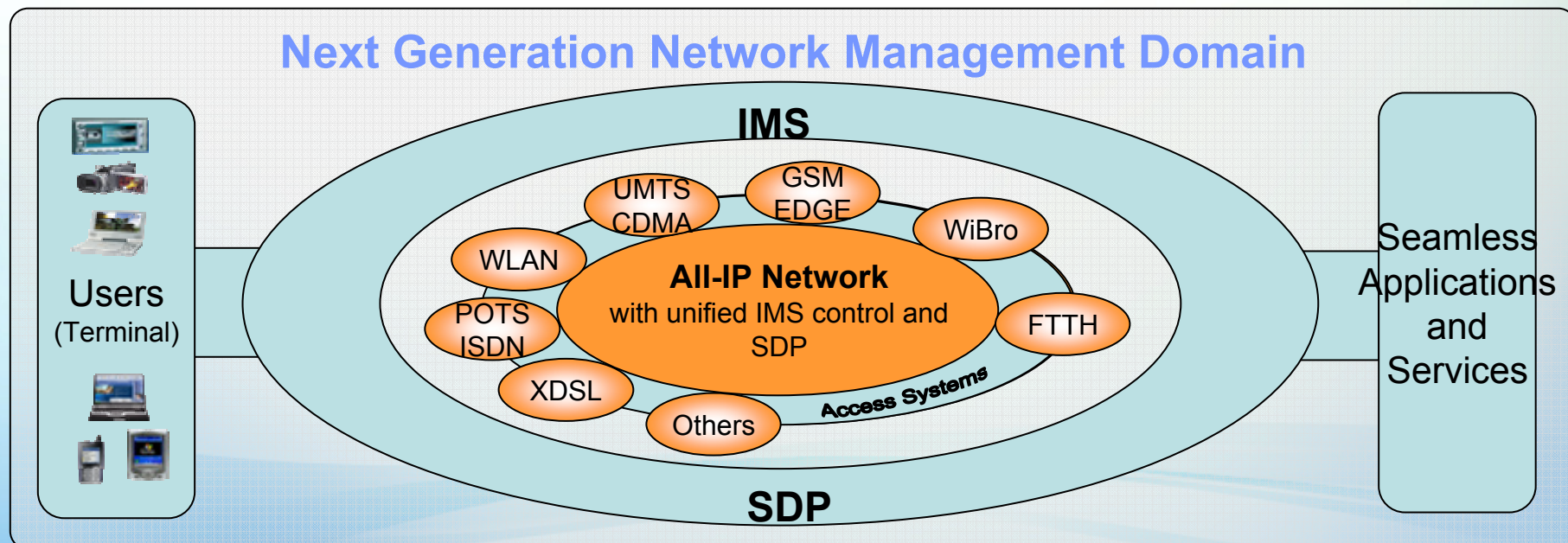
- **Essences of Network Operations and Management**

- ▶ Reduce costs, eliminate errors and improve operations quality
- ▶ Proper management of changing operations environments
- ▶ Guarantee stable and reliable service provisioning by maintaining network and service infrastructures reliable and optimal



Paradigm Shift - The Network Doesn't Matter...

- **Managed target by next generation network management consists of all equipments which are necessary for providing converged multimedia services**
 - ▶ Network would be abstracted as All-IP feature
 - ▶ Users are not aware of traditional connectivity services but multimedia application services
- **From Network focus to Service focus**



Service Quality Challenge – From Simple Internet Access to Quality Life Service

- **Key Issues of service providers with customers**

- ▶ Poor or inconsistent service quality
- ▶ Unplanned outages & resolving service quality issues in a timely manner
- ▶ Service quality guarantee on the converged traffic



Yesterday

Today & Future

Two-dimensional Quality Management

- Network focus
- Circuit-based long-lived service
- Relatively simple service mixture

Multi-dimensional Quality Management

- Service focus
- Session-based short-lived service
- Increasingly complex service mixture (QPS)



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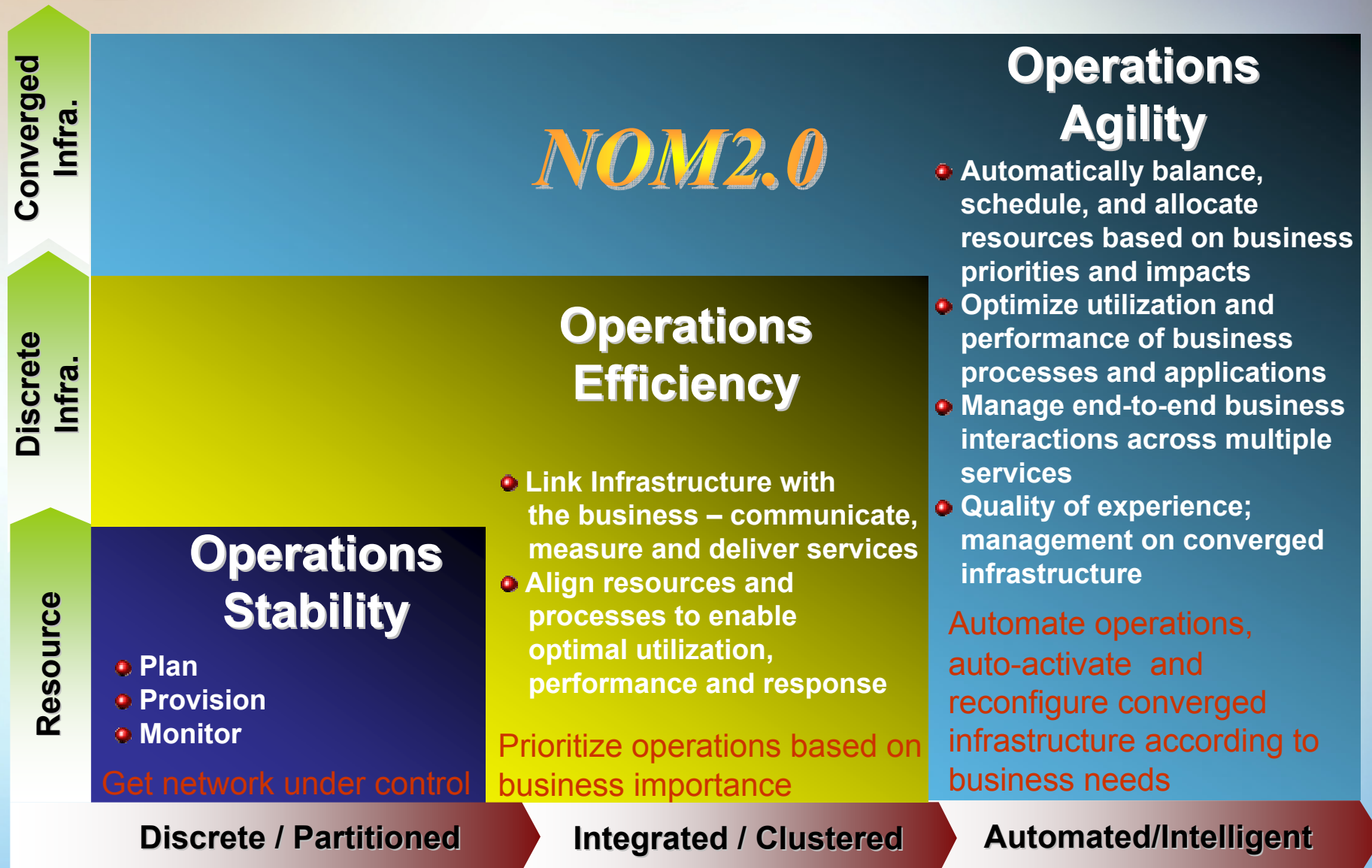
Innovative Network Operations and Management towards NOM2.0

Towards Business Agility – Network Operations Management 2.0 (NOM2.0)

- **Network Operations Management 2.0 (*NOM2.0*) for Innovative Next Generation NOM**
 - ▶ Fully automatic and intelligent
 - ▶ Agile for changing operations environment and technologies
 - ▶ High quality service better than customer's expectation
 - ▶ Complying with international standards and cutting across them



Paradigm Shift for Network Management – Roadmap for NOM2.0

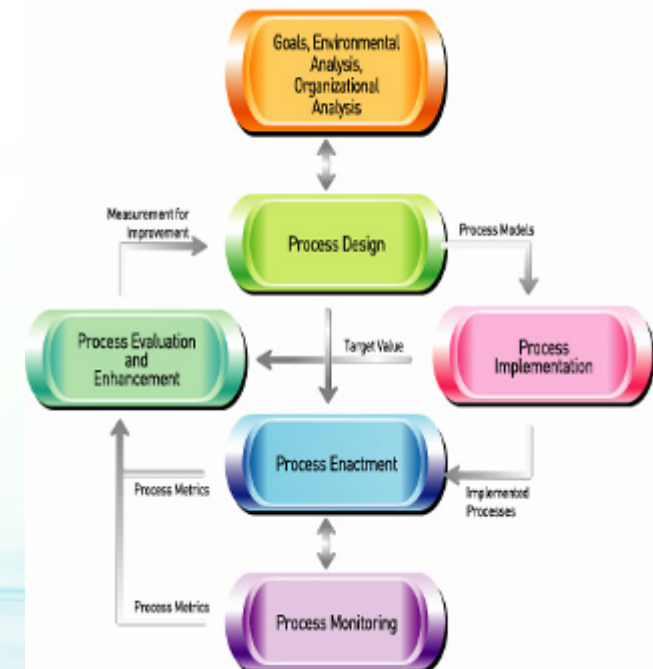


Intelligence for Network Management Systems – Automatic and Intelligent Network Management

- **Automatic intelligent management**

- ▶ Offers unprecedented automation of manual processes and repetitive tasks
- ▶ Decreases the reliance on expert engineers at every states in the management processes

- **Rule-based & Context-aware network management**
- **Continuous business process renovation with SOP-based BPM**
- **Affair-based operations environment**
- **Operations with common languages**
- **Multi-playing operators with automation and intelligence of network management systems**

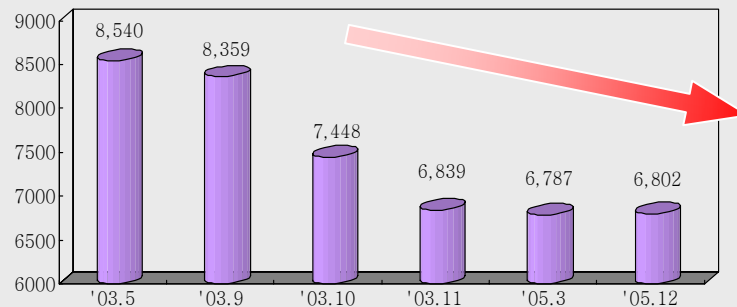


Centralized Network Operation – Remote Control and Network Surveillance

- **Effective operations for the progressive decrement of operators and the increment of unmanned offices**
 - ▶ Insufficient control functions compared to the surveillance levels of domains
 - ▶ Need E2E operations technology and remote surveillance/control guarantee due to the convergence of telecommunication service

Change of field operations environment

○ Trends of field operators



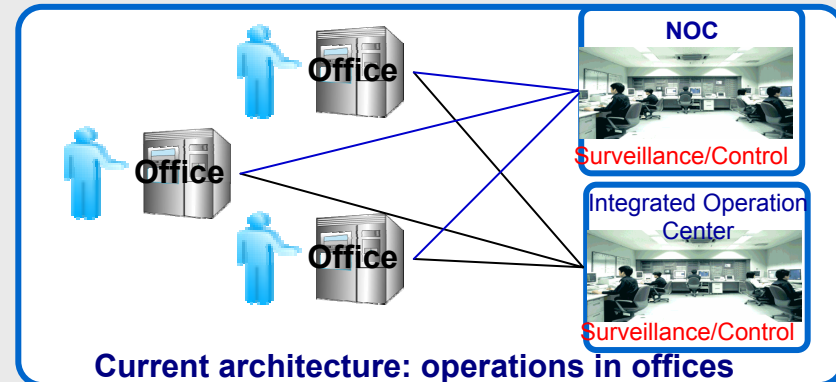
- 8,540(2003.5) → 6,802(2005.12)
: 1,738(21%) decrement

- Increased age of field operators
. Over 45 (age): 40%, below 30: 2.5%

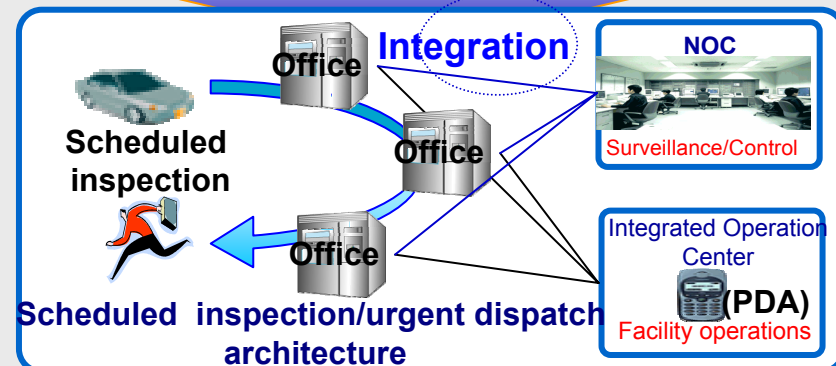
○ Unmanned office rate

Items	2007 (Year)	2009	2015	Total
# of unmanned office	1,096	1,500	1,800	1,848
Unmanned office rate	59%	82%	98%	

Transformation of field operations architecture



Effective Operations



Unmanned Office Management - Virtual Office for Unmanned Operations with Robot

- Network operations with 3-dimensional virtual offices
- 100% availability of network monitoring and controlling on unmanned offices
- Unmanned network operations with robots equipped with various sensors

Virtual Office Management System

3D Virtual
Office Mgt

Environment
Surveillance/Control

DCN
Management

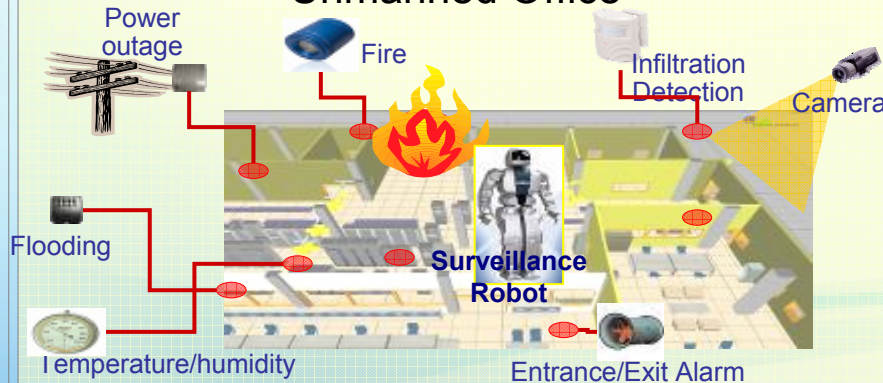


Equipment mgt (asset)

3D office
equipment

Internet

Unmanned Office



NOC (Remote Monitoring & Control)



Urgent dispatch



Network Operations Management Systems

Simple operations and control command
for various equipments

Automation of daily routine task
such as regular inspection/maintenance

Intelligent fault control

GUI/Toolkit for control command and
recovery of control command error

Fault History
mgt

Control
Rule Set

- Copyrighting operations knowledge
- Operations automation based on rule set

↑ Surveillance

↓ Control

↓ Test

Surveillance, control, test interface by equipment and domain (web service)

Surveillance, control, test interface by equipment (protocol by provided by vendor)

Terminal

Access
Network

Transmission
Network

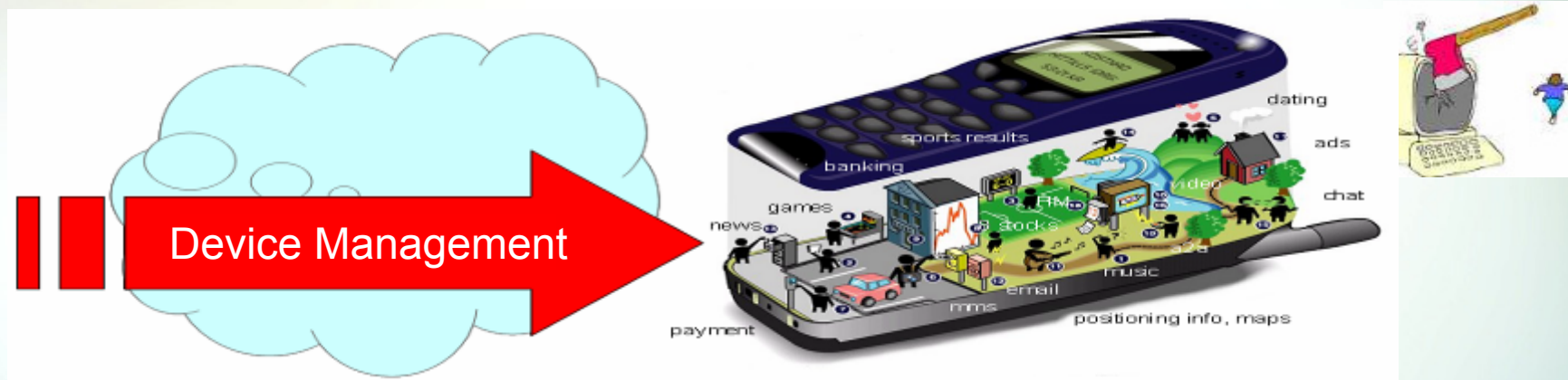
Facilities close
to apt. complex

Application
Server

Remote Device Control – Ubiquitous Device Management

- **Network and service performance or connection failure**

- ▶ Difficult in network connection methods
- ▶ Low network performance and wireless coverage scope



A lot of network and service environment configurations for customers to do

- ▶ Deterioration of customer satisfaction – failure for holding customers
- ▶ Increment of cost for customers management



Beginner

User's Lack of experiences



Power user

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Summary & Remarks

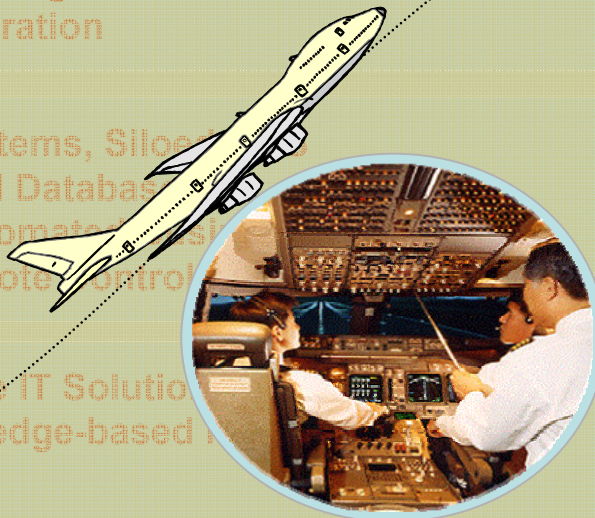
Realization of NOM2.0 - Summary and Remarks

Enjoy the world best class telecom services supported by NOM2.0

Growing Challenges

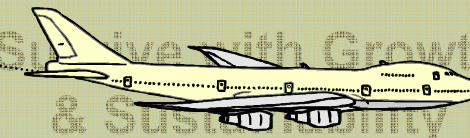
- Deregulation, Competition
- Emerging Technology
- Ever-increasing Customer Needs
- Market Saturation

- Legacy Systems, Siloed
 - Fragmented Databases
 - Lack of Automated
 - Partial Remote Control
- Time to speed up!**
- Stand Alone IT Solution
 - Low Knowledge-based
 - Others



Goals

30,000ft



Time to in-flight service!

Realization of NOM2.0

Cutting



Intelligence and Automation

Moving Speed to NOM2.0!

Silo Infrastructure

Converged Infrastructure



Wonderfull
Life Partner

KT

ありがとうございます

